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NASA TECH BRIEF

Lewis Research Center

Aerotherm Charring Materials Ablation Computer Program

The Problem:

To determine the transient transport of thermal energy in a three-dimensional material.

The Solution:

A program designed to evaluate and analyze data from the computer program ACE (LEW-11722).

How It's Done:

The Aerotherm Charring Materials Ablation (ACMA) program is an implicit, finite-difference computational procedure for computing the one-dimensional transient transport of thermal energy in a three-dimensional isotropic material which can ablate from a front surface and which can decompose in depth.

The ablating-surface boundary conditions involve considerations of surface thermochemistry. In principle, these surface thermochemical calculations could be performed within the ACMA program, however, it has proved more expedient to do these calculations in a separate program and use the tabulated results in the ACMA program.

A number of programs may be used to provide the surface thermochemistry information. One program specifically intended for this purpose and specifically designed to complement the ACMA program is the Aerotherm Chemical Equilibrium Program (ACE) (Reference: LEW-11722). The output from ACE can be used directly as input to the ACMA program.

Notes:

1. This program is written in FORTRAN IV (or FORTRAN 63) for use on the IBM 7090/7094 and CDC-1604.
2. Inquiries concerning this program should be directed to:

   COSMIC
   Computer Center
   Information Services
   112 Barrow Hall
   University of Georgia
   Athens, Georgia 30602
   Reference: LEW-11854

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